

## Gradually expanding hydraulic jump in a trapezoidal channel

### Abstract

In this study, the hydraulic jump formed in a gradually expanding stilling basin of trapezoidal cross section is investigated. The expansion of the basin is accomplished by increasing the bed width in the stream wise direction. The range of angle of expansion studied is from 3 to 9°. Experiments have been also done to study the hydraulic jumps for three different basin side slopes. Froude numbers considered ranged from 3 to 10. For a given side slope as the expansion angle increases, the jump within the stilling basin is stable particularly at larger Froude numbers. Divergence of the basin for a given side slope causes reductions in the sequent depth and jump length, and an increase of the energy loss in the jump relative to those observed in the jumps occurring in channels with unchanging rectangular or trapezoidal cross sections. It was also found that a decrease in the slope of the side walls for a given angle of expansion of the basin causes smaller sequent depth and larger jump length and energy loss than those in jumps in channels with the same angle of divergence but with vertical side walls